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L3: Entry 1 of 3

File: USPT

Jul 8, 1997

DOCUMENT-IDENTIFIER: US 5646643 A

TITLE: Liquid crystal display device

Detailed Description Text (74):

In accordance with the display data input, an ON-voltage waveform or an OFF-voltage waveform or a waveform having an intermediate potential between these waveforms is output from the data driver circuit 1321. The scanning driver circuit 1319 mainly includes a voltage dividing circuit 1325 for generating a gate potential Von making TFT 1307 a turn ON state and a gate potential Voff making TFT 1307 a turn OFF state each by dividing the power supply voltage, an operational amplifier 1329 for outputting buffer of the pervious potentials, and a switching section 1329 for receiving scanning data and selectively outputting the scanning signal to the scanning lines 1301. A scanning line voltage detecting section 1331 in an electrode shape is provided for detecting voltage other than that on the voltage input terminal of the scanning lines 1301 of the liquid crystal display device constructed as above. In an equivalent circuit, static capacitance 1333 is arranged by the scanning line voltage detecting section 1331 and the scanning lines 1301 and the liquid crystal layer 1315. For the static capacitance 1333 there have been prepared one construction using the liquid crystal layer 5 as dielectric in FIG. 14(b) and another construction formed of the scanning signal detecting section 1331 of the electrode shape provided on a SiO₂ thin film 1335 as dielectric layer formed immediately above the scanning lines 1301 in FIG. 14(c).

Detailed Description Text (99):

Specifically, by adding a sinusoidal shaped waveform generating section to the driving voltage supply circuit 719 described in the embodiment 4 and so forth, a waveform of the scanning pulses (+Vy, -Vy) is changed into the sinusoidal wave for outputting. The other portions are substantially the same construction as the liquid crystal display device described in the embodiment 4 and the others.

Detailed Description Text (108):

Specifically, by adding a dull shaped waveform generating section to the driving voltage supply circuit 719 described in the embodiment 4, waveforms of the scanning pulses (+Vy, -Vy) are changed into the sinusoidal shape for outputting. The other portions are substantially the same construction as the liquid crystal display device described in the embodiment 4 and the others.

Detailed Description Text (116):

In this embodiment 11, the static capacitance value of the static capacitance 2107 and the electric resistance value of the resistor element 2105 of the dull shaped waveform generating section 2101 have been changed so that a time constant for making the voltage waveform of the scanning pulse dull is made less than a time constant 1 [μ s] estimated from the static capacitance C_{sub}LC and the electric resistance R of the liquid crystal display element. Concretely, a time constant of 0.5 [μ s] is used in this comparison example. The same display as in the embodiment 11 is allowed to perform, and its display quality has visually been inspected. Once the entire display is made white, then the white and black horizontal strip pattern is displayed on a region vertical 150 dots.times.horizontal 10 dots at a display center, where a uniform display without crosstalk has been produced. Following this, the horizontal dot number is gradually increased up to 500 dots, then from the time of exceeding about 400 dots, slightly blacker and whiter display irregularities than those of periphery are observed on horizontal direction of the region displayed of the horizontal strip pattern, it has been confirmed that

the display quality is deteriorated.

Current US Original Classification (1):

345/100

Current US Cross Reference Classification (1):

345/58

Current US Cross Reference Classification (2):

345/94

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<u>L22</u>	L21 and shap\$3	0	<u>L22</u>
<u>L21</u>	L17 and ris\$3 with edge	2	<u>L21</u>
<u>L20</u>	L17 and pulse	4	<u>L20</u>
<u>L19</u>	L17 and pulse with shap\$3	0	<u>L19</u>
<u>L18</u>	L17 and pulse with shap\$3 with voltage	0	<u>L18</u>
<u>L17</u>	L16 and fall\$3 with edge	5	<u>L17</u>
<u>L16</u>	display with gate with line with driver and gate with select\$4 with signal	95	<u>L16</u>
<u>L15</u>	((345/\$3).ccls.) and gate with line with driv\$3 and sequential\$4 with apply\$3 with pulse with shap\$3	1	<u>L15</u>
<u>L14</u>	((345/\$3).ccls.) and gate with line with driv\$3 near4 sequential\$4 with apply\$3 with pulse with shap\$3	0	<u>L14</u>
<u>L13</u>	((345/\$3).ccls.) and gate with line with driv\$3 near4 sequential\$4 with apply\$3 with pulse with shap\$3 with voltage	0	<u>L13</u>
<u>L12</u>	((345/\$3).ccls.) and gate with line with driv\$3 near4 sequential\$4 with apply\$3 with pulse with shap\$3 with voltage with waveform	0	<u>L12</u>
<u>L11</u>	((345/\$3).ccls.) and gate with line with driv\$3	909	<u>L11</u>
<u>L10</u>	L6 and gate adj select\$4 adj signal	0	<u>L10</u>
<u>L9</u>	L6 and gate adj select\$4 with signal	0	<u>L9</u>
<u>L8</u>	L6 and gate adj3 select\$4 with signal	0	<u>L8</u>
<u>L7</u>	L6 and gate with select\$4 with signal	0	<u>L7</u>
<u>L6</u>	L5 and gate with line with driver	3	<u>L6</u>
<u>L5</u>	L4 and pixel with electrode	3	<u>L5</u>
<u>L4</u>	L3 and TFT	3	<u>L4</u>
<u>L3</u>	L2 and pulse with shap\$4 with voltage with waveform	3	<u>L3</u>
<u>L2</u>	L1 and gate with select\$5 with signal	344	<u>L2</u>
<u>L1</u>	((345/\$3).ccls.) and gate with line with driv\$3	909	<u>L1</u>

END OF SEARCH HISTORY